

C64GS

TECH DATA

NOVEMBER, 1990

PN-400401-01

SPECIFICATIONS

FEATURES

MICROPROCESSOR:

6510A, 1MHz clock — Compatible with 6502

MEMORY:

64K

ROM:

20K ROM standard includes operating system

DISPLAY:

40 columns x 25 lines of text

COLOURS:

16 background, border and characters

DISPLAY MODE:

Text characters — High resolution graphics

RESOLUTION:

320 x 200 pixels

SPRITES:

8 independent sprites, each consists of 24 x 21 pixels and up to 4 colours, each independently expandable horizontally and vertically

SOUND:

6581 Sound Interface Device includes 3 independent tone generators

PORTS:

ROM cartridge port, 2 joystick ports

SYSTEM INTERFACES

SIDE PANEL CONNECTIONS

POWER CONNECTOR:

Uses standard C64 power supply

POWER SWITCH:

Supplies power to the system

JOYSTICK PORTS:

Two standard DB9 connectors

TOP CONNECTIONS

CARTRIDGE SLOT:

The rectangular slot accepts program or game cartridges

REAR CONNECTIONS

MODULATOR SWITCH:

A switch is provided on the modulator to change the audio carrier between 6MHz (UK) and 5.5MHz (continental Europe).

RF OUTPUT:

Supplies both the picture and sound to a PAL television set.

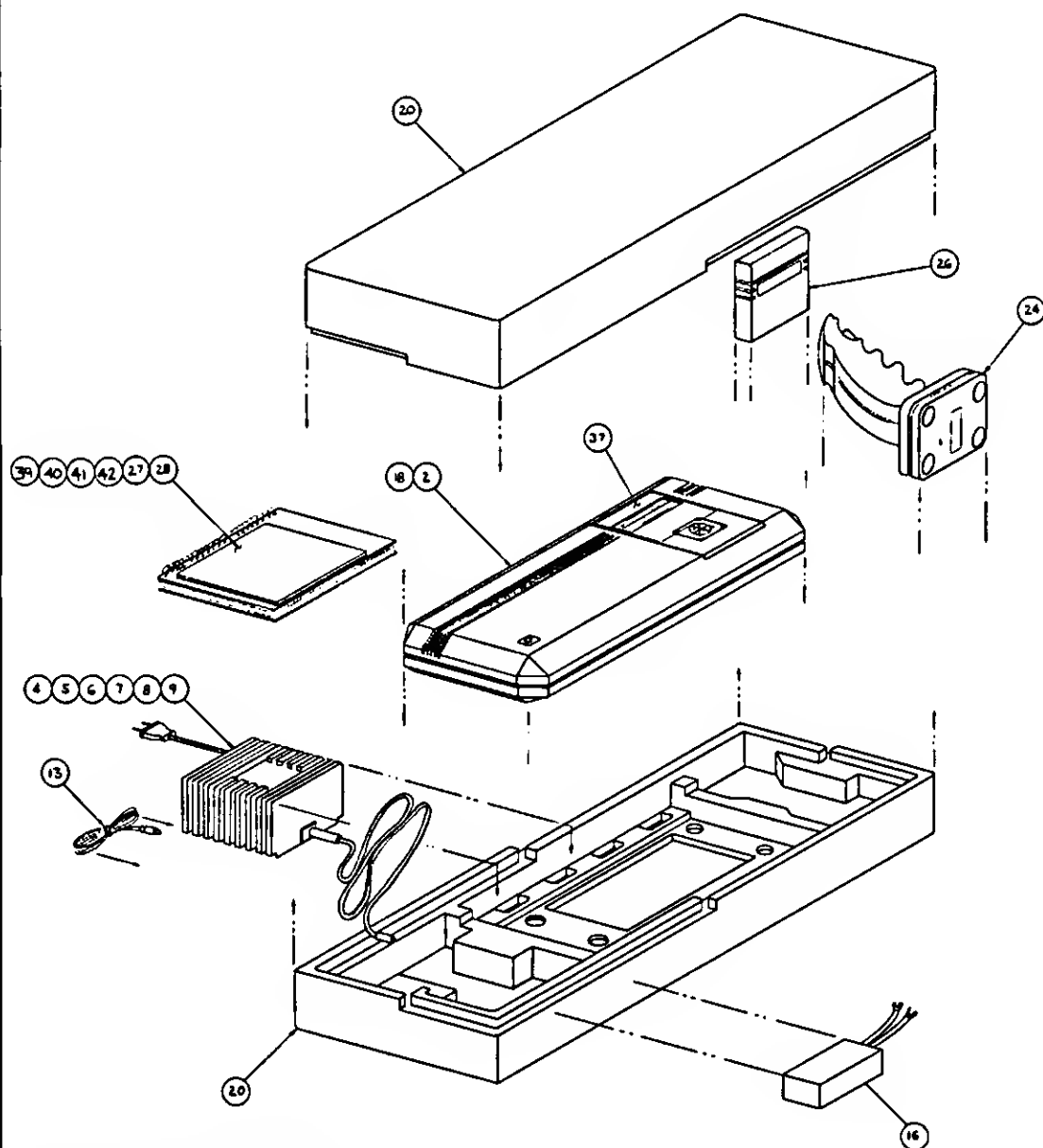
AUDIO/VIDEO OUTPUT:

This is a C64 style 8 pin DIN connector for Luma Chroma Audio connections to a PAL monitor

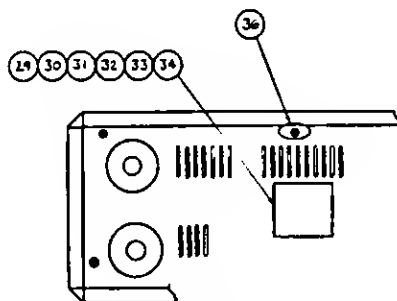
POWER REQUIREMENTS

240V, 50Hz

SHIPPING ASSEMBLY

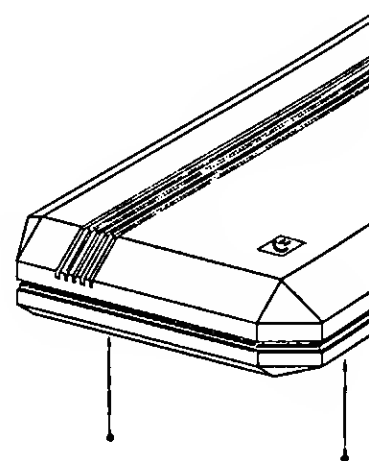


REF. NO.	PART NO.	PART NAME
1	363494-01	MAIN ASSY (NTSC)
2	363494-02	MAIN ASSY (PAL)
4	2S1053-07	POWER SUPPLY SEV
5	2S1053-09	POWER SUPPLY UL
6	2S1053-11	POWER SUPPLY VDE
7	2S1053-12	POWER SUPPLY BSI
8	2S1053-10	POWER SUPPLY UL/CSA
9	2S1053-13	POWER SUPPLY SEV SUB
	2S1053-1S	POWER SUPPLY SAA
13	2S1846-01	CABLE, RF - PAL
16	325228-01	SWITCH, RF - SWEDEN
18	1540025-01	BAG, PLASTIC
19	324257-01	BAG, DRYING AGENT
20	363528-01	END CAP, FOAM
21	363529-01	SLEEVE, C64 CONSOLE
23	363530-01	BOX, MASTER SHIPPING (1/4)
24	363531-01	JOYSTICK
26	363535-01	CARTRIDGE
27	363536-01	MANUAL, C64GS SYSTEM GUIDE
28	363537-01	MANUAL, C64GS GAME GUIDE
29	366386-01	LABEL, RATING (W. GERMAN PROD)
30	366386-02	LABEL, RATING (W. GERMAN PROD)
31	366386-03	LABEL, RATING (HK PROD)
32	366386-04	LABEL, RATING (HK PROD)
33	366386-05	LABEL, RATING (CHINA PROD)
34	366386-06	LABEL, RATING (CHINA PROD)
36	325090-02	STICKER, SEAL
37	366427-01	LABEL, STATIC CLING

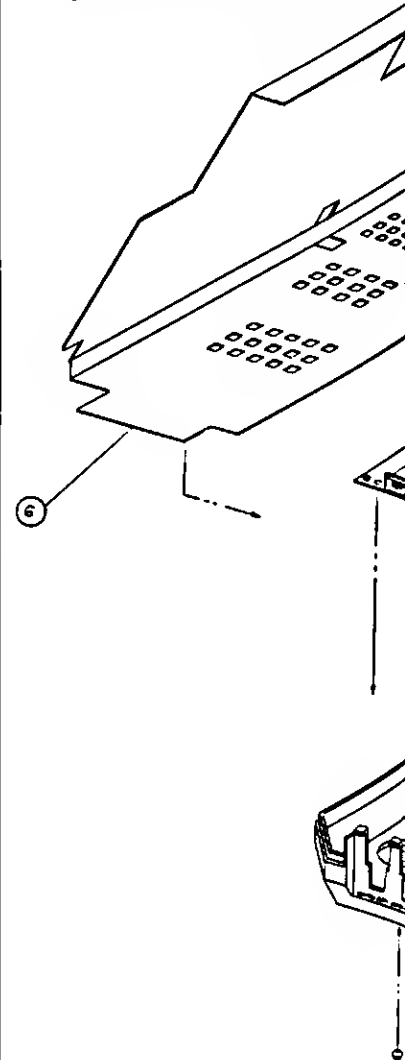


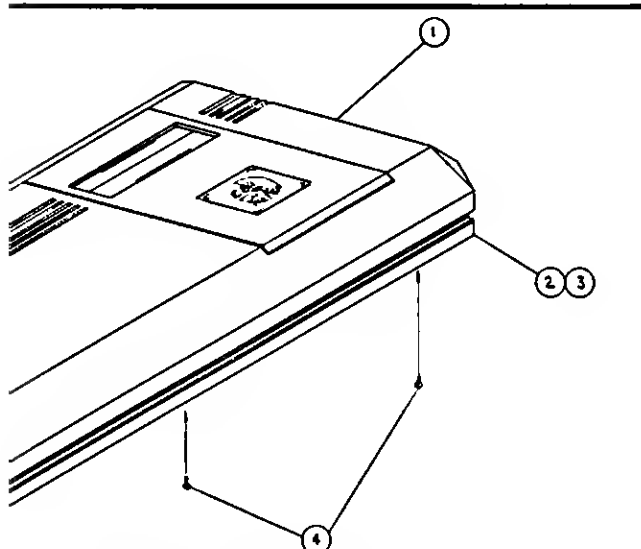
CPU BOTTOM

MAIN ASSEMBLY

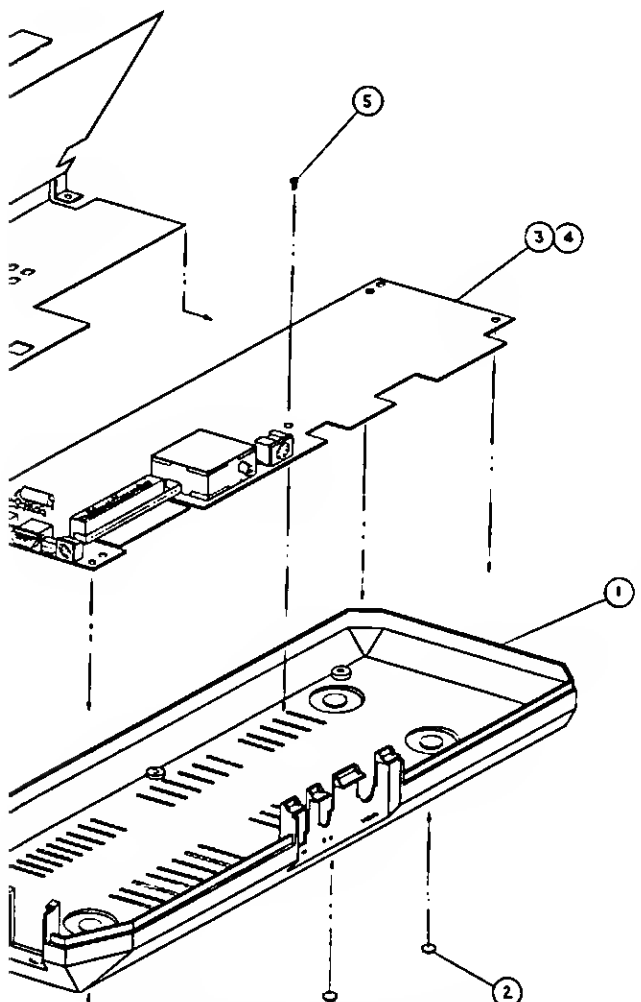


BOTTOM CASE ASSEMBLY



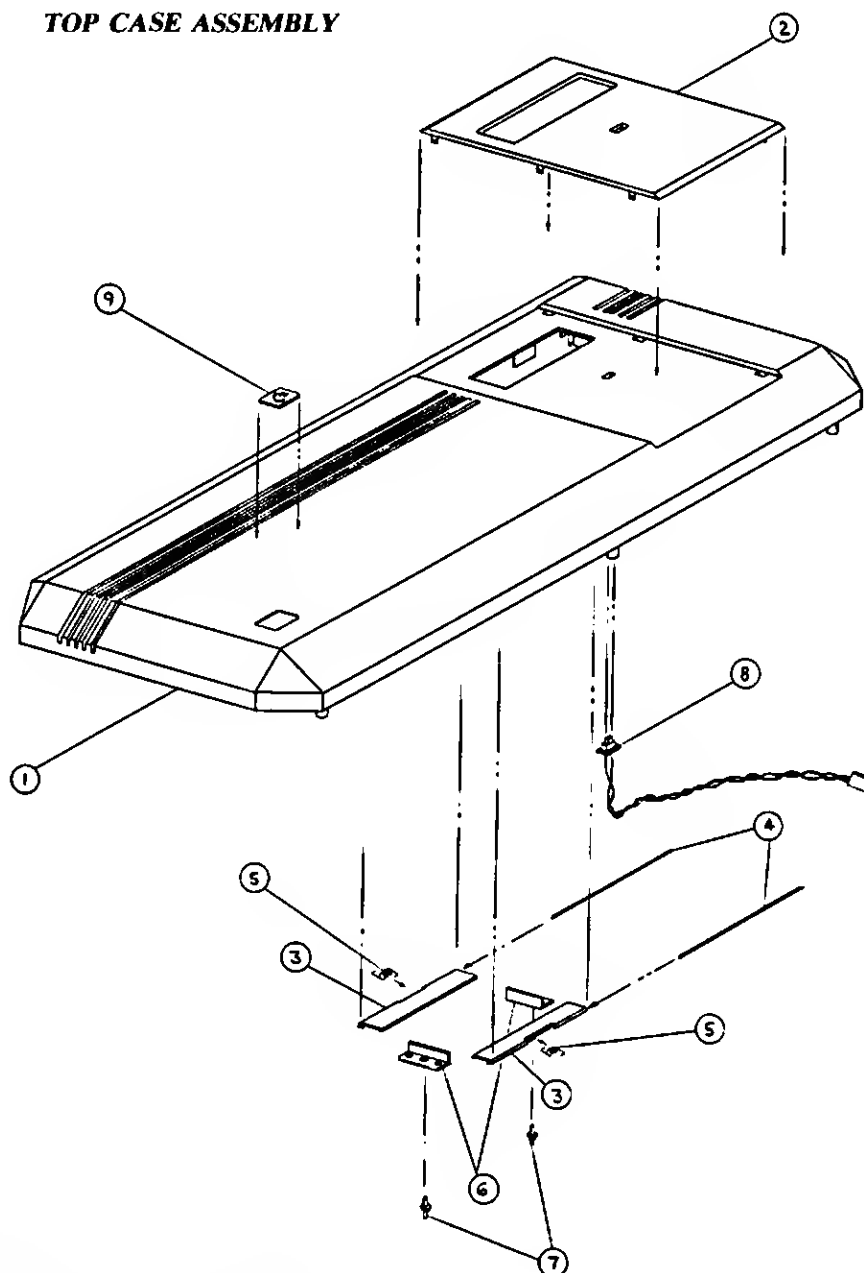


REF. NO.	PART NO.	PART NAME
1	363495-01	TOP CASE ASSY
2	313491-01	BOTTOM CASE ASSY NTSC
3	313491-02	BOTTOM CASE ASSY PAL
4	390177-02	SCREW, SELF TAP #5 TORX 3/8" QTY = 5



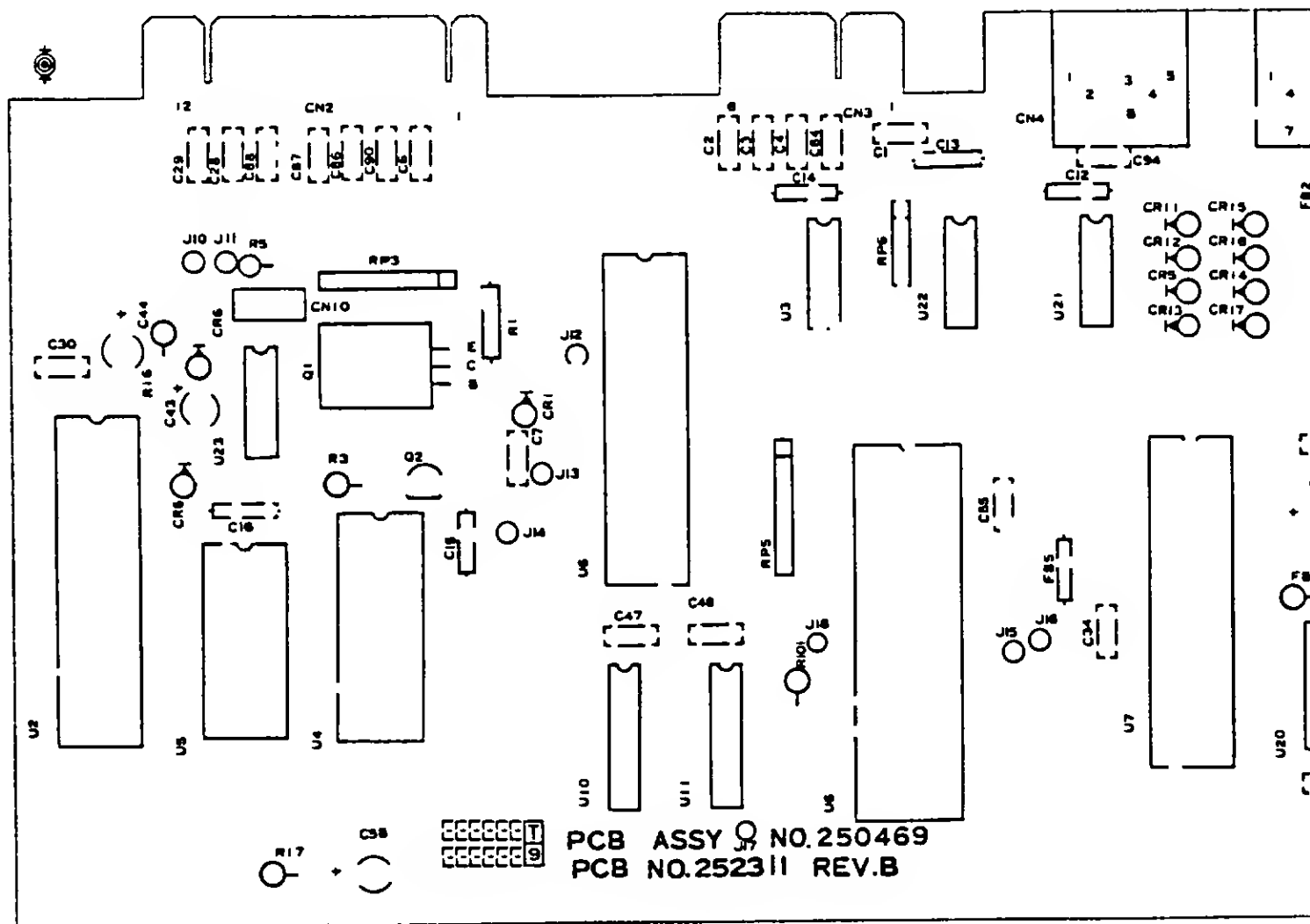
REF. NO.	PART NO.	PART NAME
1	313490-02	BOTTOM CASE
2	950150-03	FOOT, SELF ADHESIVE QTY = 4
3	250469-09	PC8 ASSY C64E NTSC
4	250469-10	PC8 ASSY PAL
5	906883-03	SCREW SELF TAP M3 X 6.0
6	363532-01	SHIELD, PAPER WRAP AROUND

TOP CASE ASSEMBLY



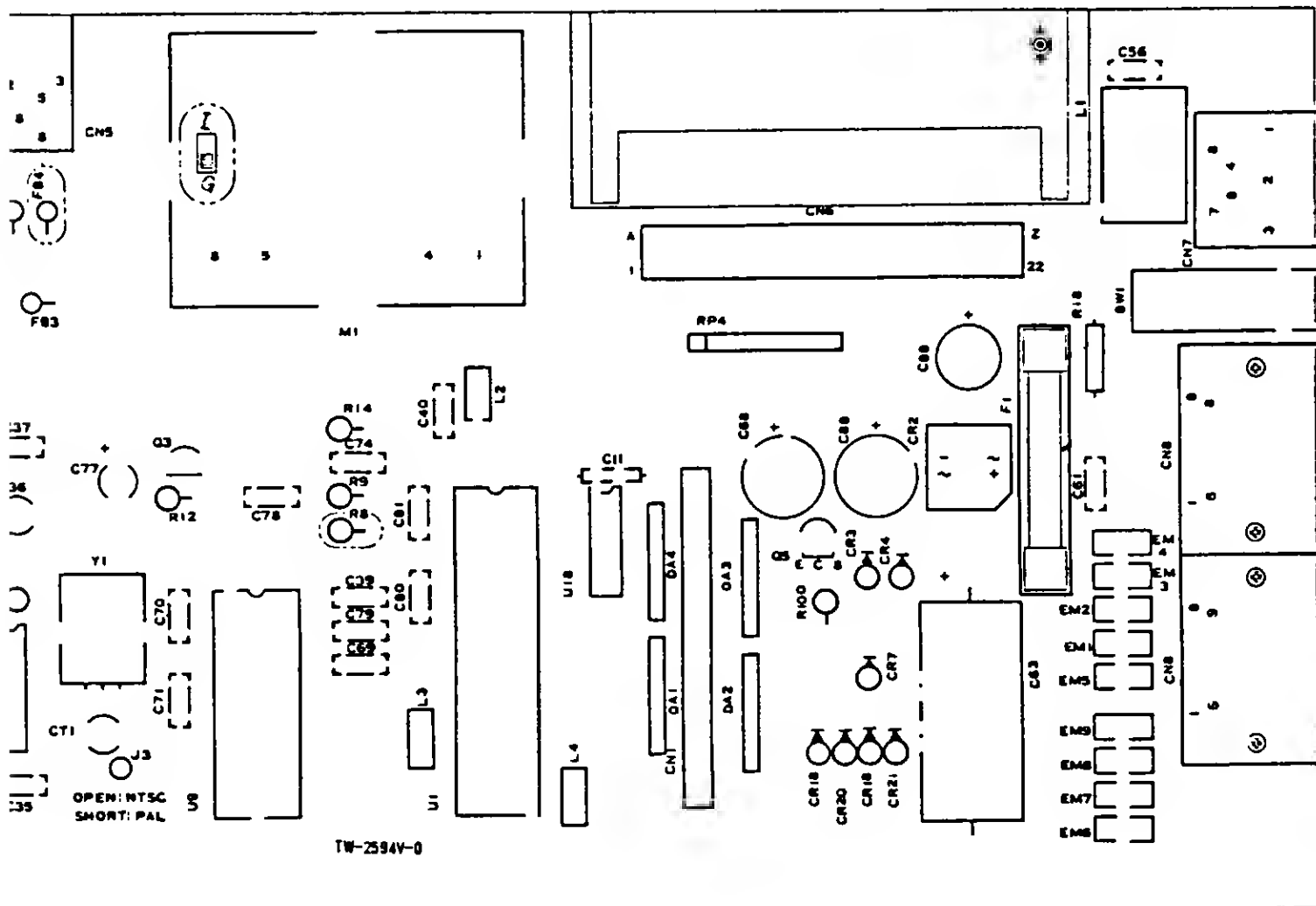
REF. NO.	PART NO.	PART NAME
1	313489-01	TOP CASE
2	313488-01	ACCENT PLATE
3	251191-01	DOOR
4	251194-01	DOOR SHAFT
5	251193-01	DOOR SPRING
6	390866-01	DOOR SHAFT BRACKET
7	363694-01	RIVET, PLASTIC
8	380016-02	LED, POWER ON L + 360MM
9	380133-06	LOGO

C64 GAME SYSTEM ASSEMBLY DIAGRAMS



Commodore International PCB Co. PCB Assembly #250

IC COMPONENTS			RESISTORS 5% @ 1/4 WATT, CARBON FILM, UNLESS OTHERWISE SPECIFIED		
318012-01	8500	U6	251068-65	390 OHM	R5
906108-01	6526	U1, U2	251068-69	560 OHM	R16
318027-01	8565	U7	251068-76	1K	R3, R12
318013-01	8580	U9	251068-101	10K	R9, R17
901225-01	2332 ROM CHAR	U5	251068-126	100K	R14
901502-01	4066	U18, U21	251068-51	100 OHM	R101
901522-06	7406	U22	901600-14	10 OHM, 1/2 W, 5%	R19
901521-03	74LS08	U3	251068-82	1.0K	R100
901521-30	74LS14	U23	CAPACITORS		
251527-08	8701T6	U20	251069-04	CER RAD 470 PF 50V	C2-4, 6, 76, 90
251527-09	8701L6	SUB FOR 251527-08	251069-12	CER RAD 2000 PF 50V	C80, C81
901453-07	2114	U19 (USE W/ U8 & REV A PCB)	251075-06	CER RAD 0.1 UF 25V	C1, 7, 28-30, 34, 35, 37, 39, 40, 47, 48, 55, 61, 69, 79, 84
390083-02	64K X 4 BIT DRAM, QTY 2	U10, U11	251304-71	CER RAD 22000 PF 50V	C70, C71
390083-01	64 K 4 BIT ORAM	SUB FOR 390083-02	251079-06	ELEC 2.2 PF 50V	C44
901453-09	2114	U19	900100-11	ELEC RAD 4.7 PF 25V	C59
901522-14	7416	U22 SUB FOR IC 7406	900100-01	ELEC RAD 10 PF 25V	C77
390083-12	64K X 4 BIT DRAM	U10, U11 SUBSTITUTE	900100-40	ELEC RAD 100 PF 16V	C58
390083-05	64K K 4 BIT DRAM	U10, U11 SUBSTITUTE	900100-03	ELEC RAD 220 PF 25V	C65
390889-01	128K ROM (GAME) U.S. PAL	U4	900101-52	ELEC RAD 1000 PF 16V	C63
251715-01	MEMORY CONTROLLER	U8 SUB USE W/REV A PCB	900100-33	ELEC RAD 47 PF 16V	C36
252535-01	MEMORY CONTROLLER	U8	900100-1B	ELEC RAD 220 PF 16V	C43
RESISTOR PACKS			390101-07	ELEC RAD 470 PF 35V	C66
902441-22	1K 6PIN 5EL	RP6	251074-09	ELEC RAD 22000 PF 25V	C70, C71 SUB FOR 251304-71
902412-07	3.3K 9PIN 8EL	RP4	251029-02	TRIMMER 7.7-40 PF	CT-1
902442-29	3.3K 6PIN 7EL	RP3, RP5	251075-01	CER RAD 0.01 UF	C56

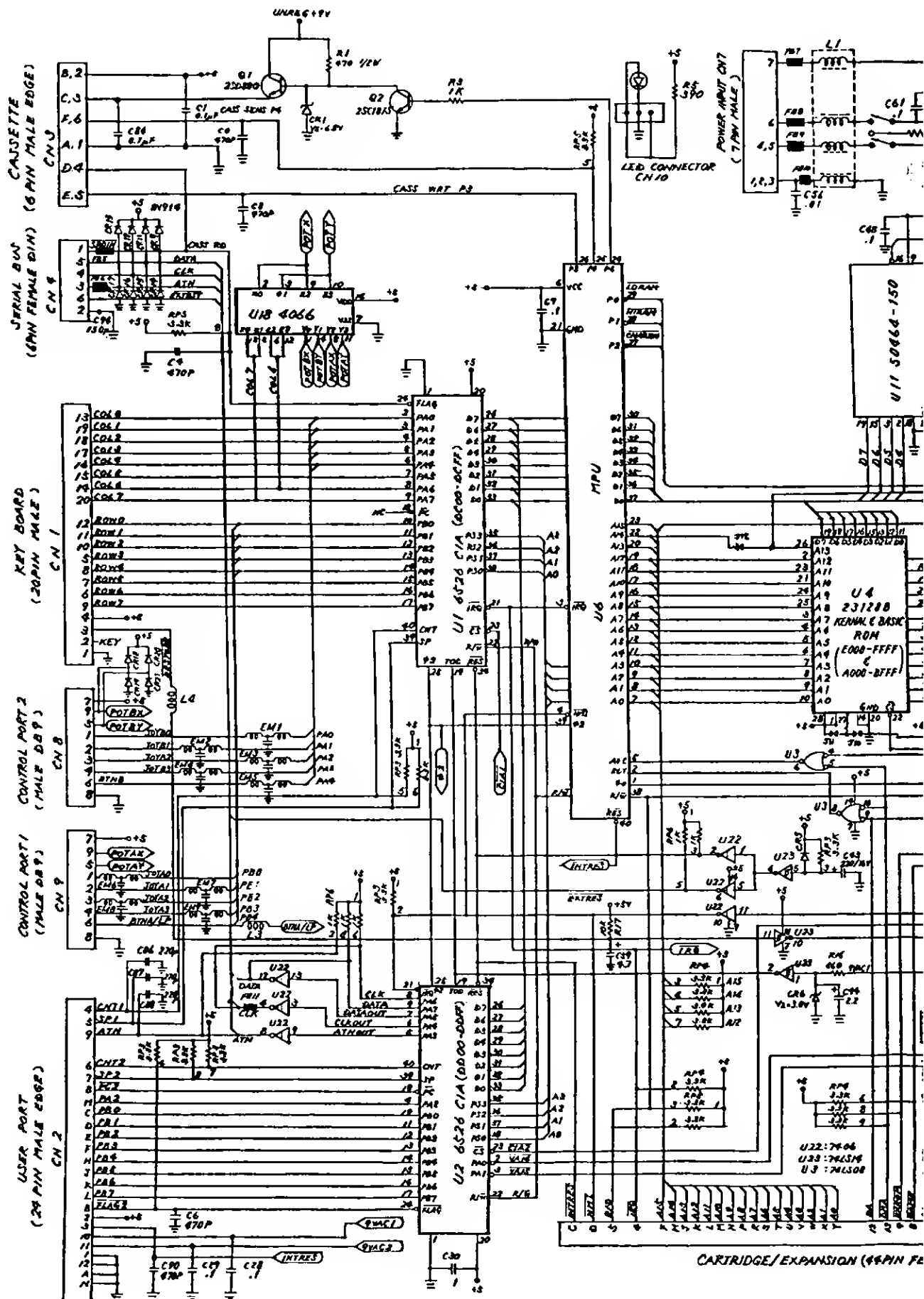


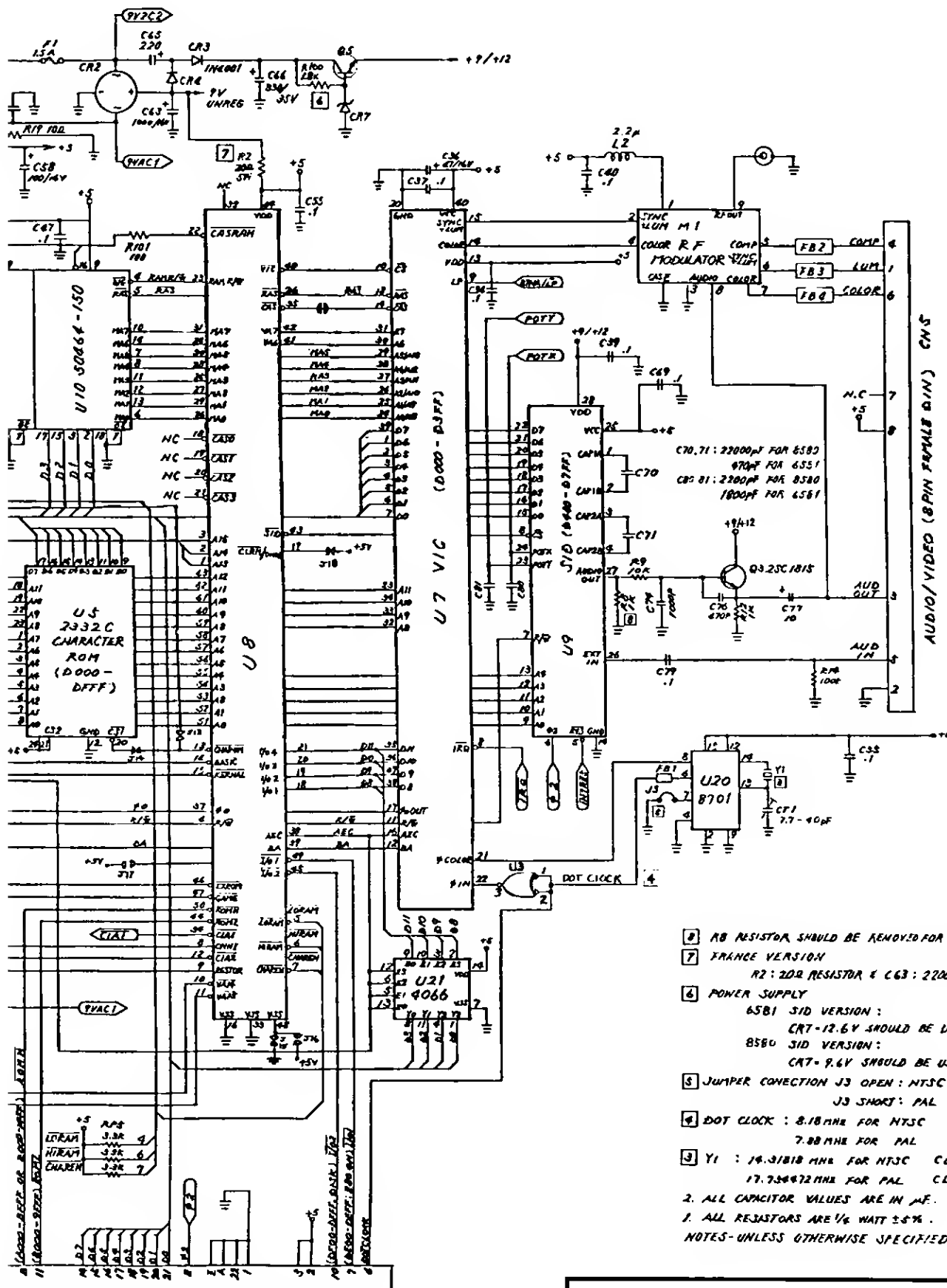
ional Spare Parts List

nponents

469-09, -10, REV. B

CONNECTORS			MISCELLANEOUS (Continued)		
251116-01	7 PIN - POWER	CN7	252026-01	DIODE BRIDGE RECT S2VB10	CR2
252168-01	8 PIN - AUDIO/VIDEO	CN5	251026-02	DIODE BRIDGE RECT DBA20B	SUB FOR 251026-01
251067-01	9 PIN MINI D - CONTROL PORTS	CN8, CN9	251026-03	DIODE BRIDGE RECT DBA20C	SUB FOR 251026-01
903332-03	HEADER ASSY 3 PIN	CN10	251842-01	EMI FILTER 270PF	EMI1-9
251251-01	44 PIN CARD EDGE - EXPANSION	CN6			DST310-55Y55271M
MISCELLANEOUS			390257-03	EMI FILTER 270PF	EMI1-9 SUB
903025-08	FERRITE BEAD LONG	FB7-FB10	902694-01	TRANSISTOR 2SC1B15	DSS310-55Y5S271M
252214-01	FERRITE BEAD 2 TURN	FB1	902671-01	TRANSISTOR 2SC945	Q2,Q3
325563-01	FERRITE BEAD	FB2,3,4 (FB4 S/B COVERED W/ ASHRINK TUBE)	251526-01	TRANSISTOR 2SC2458	Q2,Q3 SUB
		L3,4	252338-01	TRANSISTOR NPN 900mW	Q5
252341-01	RF CHOKE COIL	L1	252405-03	MODULATOR - PAL	M1
251878-02	LINE FILTER B TERMINAL	L1 SUB FOR 251878-02	904150-02	SOCKET 16 PIN (USE DN U20)	
251878-01	LINE FILTER B TERMINAL	Y1 CL 18PF	904150-05	SOCKET 28 PIN (USE ON U4,U9)	
251468-01	CRYSTAL 17.3447 MHZ	USE ON Y1	904150-06	SOCKET 40 PIN (USE ON U7)	
200018-13	JUMPER WIRE	L2	903556-1B	FUSE, NORMAL BLO 250V 1.5A	F1
901151-17	COIL INDUCTOR 2.2	CR3,4	906102-02	FUSE, CLIP (USE ON F1)	
900750-01	DIODE IN4001	CR5,9,11-21	906102-01	FUSE CLIP	SUB FOR 906102-01
251819-16	DIODE IN914 R	CR5,9,11-21 SUB FOR 251819-16	904500-01	SWITCH, ROCKER DPOT	SW1
251819-01	DIODE IN4148 R	CR6	363531-01	CARTRIDGE GUIDE - CONSOLE	
906103-04	DIODE ZENER R030EB1	CR7 FOR 8580 (HMOS SIO)	906883-03	SCREW SELF TAP M3 X 6 (FOR 9PIN OSUB)	
906103-05	DIODE ZENER RD3.0EB2	CR6 SUB FOR 906103-04	332299-01	INSULATION TAPES	
252313-63	DIODE ZENER RD10ESB2	CR7 FOR 8580 (HMOS SIO)			
		Vz = 9.48-9.90 AT 5mA			
252337-61	DIODE ZENER HZ11A1	SUB FOR 252313-63			



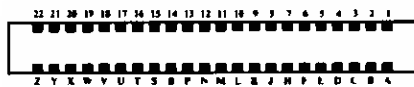


1. 10K RESISTOR SHOULD BE REMOVED FOR 8580 SID.
2. FRANCE VERSION
R2: 200 RESISTOR & C63: 2200µF CAPACITOR REQUIRED
3. POWER SUPPLY
6581 SID VERSION:
CRT-12.6V SHOULD BE USED
8580 SID VERSION:
CAT-9.6V SHOULD BE USED
4. JUMPER CONNECTION J3 OPEN: NTSC
J3 SHORT: PAL
5. DOT CLOCK: 8.18MHz FOR NTSC
7.88MHz FOR PAL
6. Y1: 14.31818 MHz FOR NTSC CL-18P
17.734972 MHz FOR PAL CL-18P
7. ALL CAPACITOR VALUES ARE IN µF.
8. ALL RESISTORS ARE 1/4 WATT ±5%.
- NOTES-UNLESS OTHERWISE SPECIFIED:

EMALE) CN6

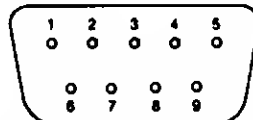
Schematic #252312, Rev. B
 Sheet 1 of 1

CARTRIDGE EXPANSION SLOT CN6



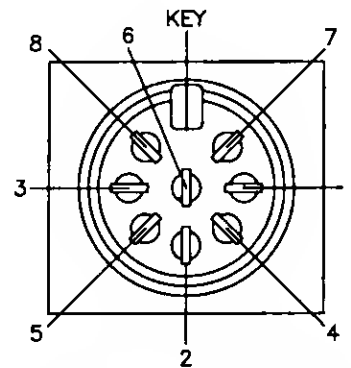
PIN	TYPE	PIN	TYPE
1	GND	A	GND
2	+5V	B	ROMH
3	+5V	C	RESET
4	IRQ	D	NMI
5	R/W	E	S 02
6	Dot Clock	F	A15
7	I/D 1	H	A14
8	GAME	J	A13
9	EXROM	K	A12
10	I/O 2	L	A11
11	ROML	M	A10
12	BA	N	A9
13	DMA	P	A8
14	D7	R	A7
15	D6	S	A6
16	D5	T	A5
17	D4	U	A4
18	D3	V	A3
19	D2	W	A2
20	D1	X	A1
21	D0	Y	A0
22	GND	Z	GND

JOYSTICK CN8, CN9



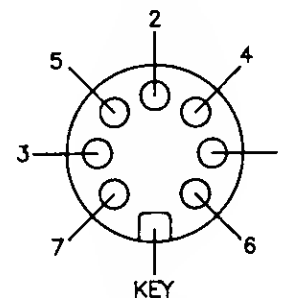
PIN	PORT 1 TYPE	PORT 2 TYPE
1	JOYA0	JDYB0
2	JDYA1	JDYB1
3	JDYA2	JOYB2
4	JOYA3	JOYB3
5	POT AY	POT BY
6	BUTTON A/LP	BUTTON B
7	+5V (Max 50MA)	+5V
8	GND	GND
9	POT AX	POT BX

AUDIO/VIDEO CN5



PIN	TYPE	PIN	TYPE
1	LUM	5	AUD/IN
2	GND	6	COLD R
3	AUD/OUT	7	NC
4	COMPOSITE	8	+5

POWER CN7



PIN	TYPE	PIN	TYPE
1	NC	5	+5 VDC
2	GND	6	9VAC
3	NC	7	9 VAC
4	NC		

TROUBLESHOOTING GUIDE C64 GAMES SYSTEM (C64 E PCB)

SYMPTOM

Abnormal colors appear in text
 Wrong characters are displayed
 System does not reset
 White band scrolls down the screen (60/50 Hz Hum)
 Wavy screen after system warms up
 Black band scrolls through screen when system warms up
 Blank screen on power up

 System powers up with all characters displayed as blocks
 Intermittent display
 Joystick does not operate correctly
 Wrong frequency
 No text is displayed
 Graphic characters displayed instead of text displayed
 No Sound

POSSIBLE SOLUTION

Check U19 (2114 RAM); U21 (4066); U7 (VIC)
 Check RAM (U10,U11)
 Check U20 (556 IC)
 Check External Power Supply; VR2 (5V regulator)
 Check External Power Supply — U20, U7
 Check External Power Supply; CR2, C65, C66
 Check External Power Supply; U4 (Kernal/Basic ROM); U8 (MMU); U6 (MPU); U7 (VIC); U22, U23; U10, U11 (RAM); C22
 Check U8 (MMU); U7 (VIC)
 Check Connectors — C63, C66
 Check U1 (CIA); U18 (4066); EMI 1-9
 Check C70, C41
 Check U4, U5 (ROMS); U2 (CIA); U7 (VIC)
 Check U7 (VIC); U2 (CIA); U8 (MMU)
 Check U19 (SID); FI (Blown fuse)